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## MORE NEW SPECIES AND NEW RECORDS OF FISHES FROM BERMUDA<sup>1</sup>

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The present paper is based primarily on a series of fishes collected by Louis L. Mowbray, former Director of the Bermuda Aquarium, and presented to Chicago Natural History Museum by his son, Louis S. Mowbray, present Director of the Aquarium. A few species collected by L. S. Mowbray and others, as well as specimens from the United States National Museum, are included.

A complete record of the fishes in the Mowbray collection will not be attempted; however, this report is a continuation of the program of studies on Bermuda fishes undertaken in 1948 (see Woods and Kanazawa, 1951).

The present paper describes and presents notes on specimens of the following species:

- Ophichthyidae.....*Callechelys bilinearis* sp. nov.  
Muraenidae.....*Anarchias yoshiae* sp. nov.  
Syngnathidae.....*Hippocampus obtusus* Ginsburg  
*Hippocampus zosterae* Jordan and Gilbert  
Polynemidae.....*Polydactylus virginicus* Linnaeus  
Bramidae.....*Collybus drachme* Snyder  
Serranidae.....*Prionodes tabacarius* Cuvier and Valenciennes  
Pseudochromidae.....*Rhegma bermudensis* sp. nov.  
Cepolidae.....*Cepola* sp.  
Dactyloscopidae.....*Dactyloscopus tridigitatus* Gill  
*Gillellus greyae* sp. nov.  
Clinidae.....*Malacoctenus macropus* Poey  
*Malacoctenus bimaculatus* Steindachner  
Blenniidae.....*Blennius marmoreus* Poey  
Microdesmidae.....*Microdesmus woodsi* sp. nov.  
Gobiesocidae.....*Cotylis nigripinnis nigripinnis* Peters  
Triacanthidae.....*Hollardia hollardi* Poey

Standard length is measured from tip of snout to base of caudal fin rays, and other measurements taken follow standard procedure except where noted otherwise in the description.

<sup>1</sup> The Bermuda Biological Station, Contribution No. 170.

I wish to acknowledge my indebtedness to Dr. Karl P. Schmidt, Chief Curator, and Mr. Loren P. Woods, Mr. Robert F. Inger, and Mrs. Marion Grey, of the Division of Fishes, all of Chicago Natural History Museum, for their valuable assistance in preparing this manuscript; to Dr. Rainer Zangerl, also of this Museum, for the X-rays of numerous fishes from which vertebrae counts were secured; to Dr. Leonard P. Schultz, of the United States National Museum, for valuable suggestions with regard to this manuscript; to Mr. Isaac Ginsburg, of the United States Fish and Wildlife Service, for verifying the identifications and notes on *Hippocampus obtusus*; to Dr. Daniel Merriman, for loan of comparative material from the Bingham Oceanographic Laboratory; and to Dr. Gerard Belloc, of the Monaco Oceanographic Institute, for examining specimens deposited in the Monaco Museum. I also wish to thank Miss Margaret Bradbury, Staff Artist of the Department of Zoology, for her careful illustrations of the types and paratype of the new species.

#### Family OPHICHTHYIDAE

##### ***Callechelys bilinearis* sp. nov.** Figure 9.

*Type*.—C.N.H.M. no. 48973, Bermuda, Cooper's Island and St. Davids, June, 1938; collector Mr. F. Lamb; total length 597 mm.

*Paratype*.—C.N.H.M. no. 48974, Bermuda, taken from stomach of a seven-pound porgy, which was taken at depth of 9 fathoms, December 17, 1937; collector Mr. Astwood; total length 571 mm. Condition poor.

*Diagnosis*.—Two lateral dark stripes from head to tail; three canine-like premaxillary teeth, anterior teeth single and posterior, paired; tip of snout to origin of dorsal fin 2.97–3.35 in total length; angle of gill opening 130°.

*Description* (proportions of paratype in parentheses).—Depth of body 35.12 (34.61), length of head 12.7 (12.81), length of trunk 1.80 (1.87), length of tail 2.75 (2.69), all in total length; snout 10.44 (12.35), tip of snout to inner rictus 3.61 (3.87), lower jaw (to inner rictus) 5.88 (6.35), tip of snout to origin of dorsal fin (origin of dorsal membrane) 3.35 (2.97), length of gill opening 6.72 (7.42), all in length of head (tip of snout to posterior margin of gill opening); width of isthmus 2.80 (2.00) in length of gill opening; eye 2.41 (1.64) in snout; angle of gill opening 131° (130°), formed by a line passing through upper and lower margin of gill opening with a line parallel to length-

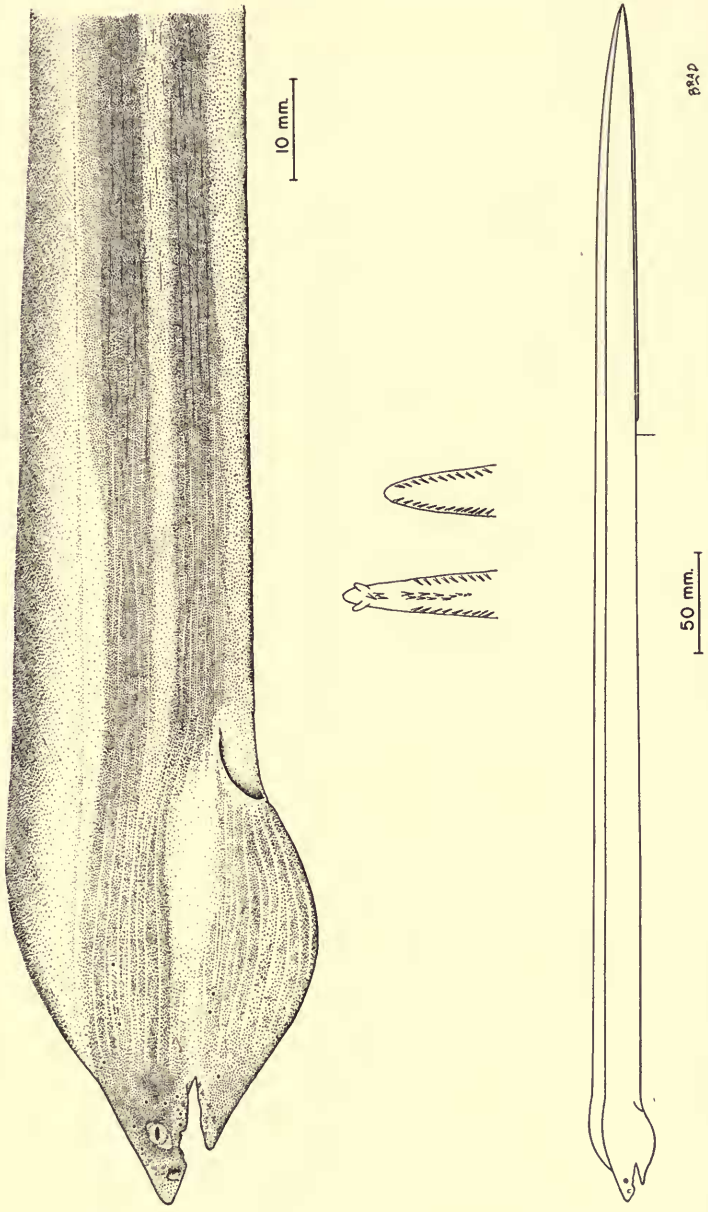


FIG. 9. *Callechelys bilinearis* sp. nov., type, showing head, dentition and outline; C.N.H.M. no. 48973; total length 597 mm.

wise axis of body (see Table 2 for measurements expressed in thousandths of total length).

Body snake-like, tapering gradually from head to hard pointed tail; origin of dorsal fin above posterior margin of jaw; origin of anal fin just posterior to anus; ventral and pectoral fins absent; head pointed, snout extending beyond lower jaw, anterior margin of lower jaw reaching a little past a vertical through anterior margin of eye; anterior nostrils tubular on under side of snout, located halfway from tip of snout to anterior margin of eye; posterior nostrils on inner under side of upper lip below eye, covered with flap, folded to appear tube-like; all teeth slender, conical, uniserial in jaws, three canine-like premaxillary teeth, eleven teeth on vomer mostly biserial, separated from premaxillaries by a space (see fig. 9); gill opening inferior; isthmus very narrow; eye small, covered with membrane; scales absent.

*Color* (in alcohol).—General color of body blackish brown with three lateral white stripes from head to tail; dorsal stripe extending from origin of dorsal fin to tail, the white extending onto dorsal fin base, anterior part of band wider than posterior; middle stripe along middle of sides; ventral stripe from gill opening along anal fin base to tail. A blackish brown band from isthmus to vent, dividing the two ventral white bands on either side. The head lighter in color with whitish streaks; a wide white band from behind jaw to white gill opening; branchial pouch brownish; jaws whitish; dorsal fin brownish black, whitish along base; anal fin white, edged lightly with brownish black.

*Remarks*.—This species shows affinities to the genus *Callechelys*, as defined by Storey (1939) in her revision of the ophichthyid eels, in the following characters: pectorals absent, gill opening low, isthmus narrower than gill opening, head moderate, tail shorter than trunk, dorsal fin moderate, origin above angle of jaw, maxillary teeth confined to posterior two-thirds of jaw, body moderately heavy, body and fins strikingly marked. Storey states that premaxillary teeth are usually paired; however, *bilinearis* has three premaxillary teeth, the anterior single and the posterior paired.

This species differs from every other member of this genus in its color pattern and dentition. The body proportions are closest to *C. muraena* Storey (1939); however, it differs in the length from the tip of the snout to the origin of the dorsal fin and in the angle of the gill opening (*muraena* 164°; *bilinearis* 130–131°). The general color pattern resembles *C. melanotaenia* Bleeker (1864) from the Philip-

pinces. Instead of a single lateral dark stripe *C. bilinearis* has two dark stripes, and the dorsal fin of *melanotaenia* is pale and the distal ends are dusky.

KEY TO SPECIES OF CALLECHELYS FROM WESTERN ATLANTIC

- 1a. Two lateral dark stripes on side of body, gill opening forming an angle of about 130° with lengthwise axis of body, three premaxillary teeth.  
*bilinearis* sp. nov.
- 1b. No dark stripe on body, body with dark spots, gill opening forming an angle of about 160° with lengthwise axis of body, two premaxillary teeth.
  - 2a. Depth of body 43, length of head 15, length of trunk 1.65, all in total length; width of isthmus 3.65 in length of head (Florida, Sanibel Island).....*perryae* Storey
  - 2b. Depth of body 35.7, length of head 12.2, length of trunk 1.85, all in total length; width of isthmus 2.1 in length of head (Florida, Snapper Banks).....*muraena* Jordan and Evermann

Family MURAENIDAE

*Anarchias yoshiae* sp. nov. Figure 10.

*Type*.—C.N.H.M. no. 48729, Bermuda, ship's channel, June, 1927; collector R. S. McCallum; total length 136 mm.

*Paratypes*.—C.N.H.M. no. 48955, Bermuda, Castle Harbor, August, 1927; collector L. L. Mowbray; total length 116 mm. U.S.N.M. no. 77748, Florida, reef off Key West; collector J. B. Henderson; total length 74 mm. U.S.N.M. no. 153163, Florida, off Palm Beach, rocky reef at depth of 20–30 fathoms, April, 1950; collectors Messrs. Thompson and McGinty; total length 46.5 mm.

*Diagnosis*.—Vertebrae 103–105; trunk and head shorter than tail; three to six vomerine teeth in a single row, two or three curved canines in a single row in middle of premaxillary; gill opening horizontal above level of rictus of jaw; a pair of nasal openings over eye, the inner pore a little posterior to larger nasal opening.

*Description* (proportions of paratypes in parentheses).—Length of head (tip of snout to anterior margin of gill opening) 9.07 (7.75–8.92), tip of snout to vent 2.58 (2.32–2.47), vent to tip of caudal fin 1.61 (1.68–1.76), all in total length; snout 6.82 (6.66–7.64), diameter of orbit 15.00 (13.00–15.00), tip of snout to rictus of jaw 2.83 (2.71–3.00), interorbital width 12.5 (14.44–17.00), greatest depth of body 2.50 (2.65–3.15), width of head 4.17 (4.47–4.62), all in length of head; number of vertebrae 103 (105) (see Table 2 for measurements expressed in thousandths of total length).

Body elongate, anal and dorsal fins reduced to median folds confluent with caudal fin, paired fins absent; lateral line pores present,

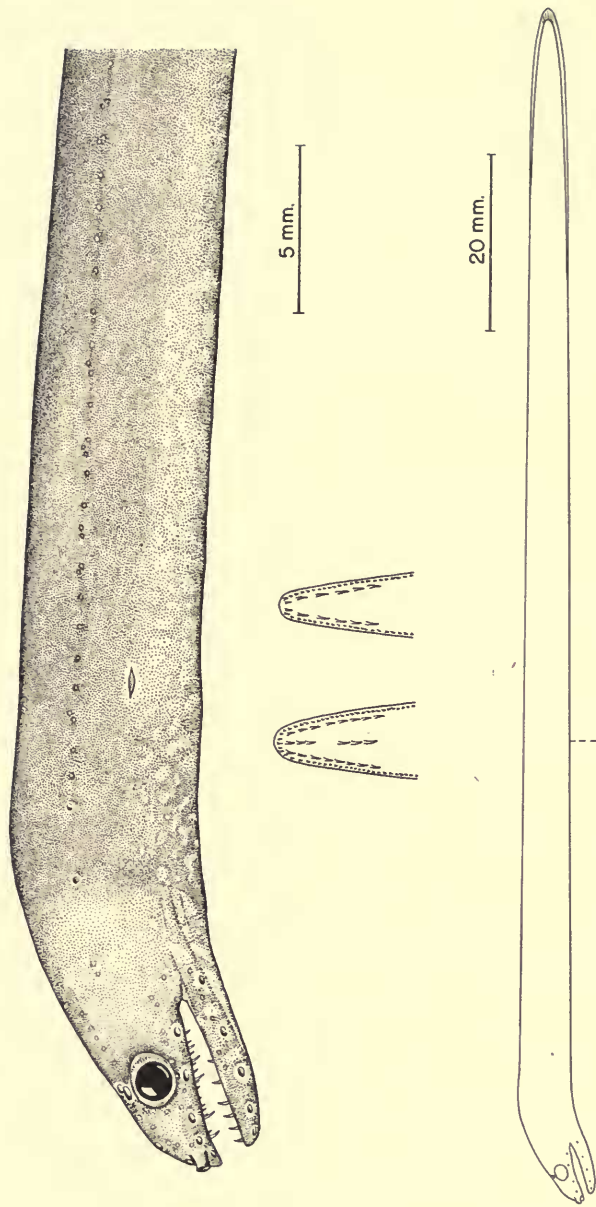


FIG. 10. *Anarchias goshiae* sp. nov., type, showing head, dentition and outline; C.N.H.M. no. 48729; total length 136 mm.

spaced; snout blunt; anterior nostrils tubular, near tip of snout, a pair of nasal openings separated by dermal skin above eye, inner opening posterior to larger nasal opening; gill opening horizontal and small, above level of rictus of jaw; teeth in jaws biserial, outer series small and close set, inner series depressible, larger and spaced; three to six vomerine teeth in a single row, two or three curved canine teeth in a single row in middle of premaxillary (fig. 10); five large pores on upper and lower jaws on each side, a pair of pores on anterior part of snout; tiny pores arranged in linear series on upper surface of snout, around eye, around rictus to lower jaw.

*Color* (in alcohol).—The general color reddish brown, lower jaw and chin mottled white, paler on chin posteriorly.

*Remarks*.—This species belongs to the genus *Anarchias* Jordan and Evermann (1900), as redefined by Schultz (MS.), by the following characters: tip of lower jaw bluntly rounded, dorsal and anal fins reduced to rudiments near tip of tail, and double posterior nasal openings over each eye.

#### KEY TO SPECIES OF ANARCHIAS AND RELATED GENUS UROPTERYGIUS FROM THE ATLANTIC

- 1a. Posterior nostril a single pore, vertebrae 123 (Bahamas, West Caicos Island).  
*Uropterygius acutus* Parr
- 1b. Posterior nostrils a double pore, inner pore posterior to outer pore.
  - 2a. Color reddish or brownish with whitish yellow marbling on body, vertebrae 117, length of head 7.15–7.87 in total length (France, Nice; Cape Verde Islands) . . . . . *Anarchias grassi* Roule
  - 2b. Color reddish brown, lower jaw and chin mottled with white, no marbling on body, vertebrae 103–105, length of head 7.75–9.07 in total length (Bermuda, Florida) . . . . . *Anarchias yoshiae* sp. nov.

This species has been named *yoshiae* in honor of my wife Yoshie.

#### Family SYNGNATHIDAE

##### *Hippocampus obtusus* Ginsburg.

*Hippocampus obtusus* Ginsburg, 1933, Journ. Wash. Acad. Sci., 23: 562—off Cape Hatteras, North Carolina; Ginsburg, 1937, Proc. U. S. Nat. Mus., 83: 576, fig. 67.

*Bermuda record*.—C.N.H.M. no. 49017, Harrington Sound, September, 1936; collector L. L. Mowbray; one female, 122 mm. in length. C.N.H.M. no. 49016, Bermuda, March, 1914; collector L. L. Mowbray; one male, 125 mm. in length.

*Description*.—Trunk segments 11, caudal segments 34–36, dorsal rays 17–19, pectoral rays 16–17.

Depth 10.5–11.56 (first from female, second from male); snout 13.0–10.5, postorbital length 9.85–9.6 (to posterior margin of gill opening), head 25.4–22.8, trunk 36.1–32.4 (middle of last trunk segment and first caudal segment to anterior edge of gill opening), caudal 57.8–63.1, orbit 3.52–3.28, all in percentage of length (tip of caudal to tip of coronet).

First caudal segment hexangular, last trunk segment octangular, penultimate trunk segment septangular. Every fourth tubercle on dorsal trunk and anterior part of tail stout, reduced to knob-like stumps, bluntly obtuse; trunk very slender, body on male covered with pimple-like excrescences on skin, smaller on side, larger on back.

*Color* (in alcohol).—Male dusky, with raised tubercles on back and tail whitish; female uniformly yellowish with three dusky blotches across back and tail.

*Remarks*.—This species has been known previously only from the type specimen.

The following observations and notes are from Ginsburg (in litt.): "The two specimens further prove that *obtusus* has a very slender body, more slender even than *reidi*<sup>1</sup> when the larger specimens are compared sex for sex, and it does not have the finely spotted color pattern which is a constant feature of *reidi*. In occasional variants of *reidi* the structure of the tubercles approaches that of *obtusus*, but in the bulk of specimens of *reidi* the structure of the tubercles is notably different than in *obtusus*. The latter species apparently averages a higher dorsal count than *reidi*, but their frequency distribution will no doubt overlap widely."

### **Hippocampus zosterae** Jordan and Gilbert.

*Hippocampus zosterae* Jordan and Gilbert, 1882, Proc. U. S. Nat. Mus., 5: 265—Laguna Grande, Pensacola, Florida.

*Bermuda record*.—C.N.H.M. no. 49019, Hamilton Harbor, after westerly gale, March 8, 1907; collector L. L. Mowbray; one male, 37 mm. in length. C.N.H.M. no. 49020, sound side of Agars Island, in sargassum, March 10, 1908; collector L. L. Mowbray; four specimens from 32.5 to 37 mm. in length, one female and three males.

*Description*.—Trunk segments 9 or 10, caudal segments 30–34, dorsal fin rays 10–13, pectoral rays 10–11.

Depth of deepest segment, males 14.8–16.7 (one male with brood pouch full of young 20.8), female 10.7 (lowest point on upper seg-

<sup>1</sup>*Hippocampus reidi* Ginsburg, 1933, a closely related species, has been reported previously from Bermuda.



ment to ventral ridge, excluding spines), head 21.9–24.3 (to dorsal gill opening), trunk 28.4–33.8 (from last trunk segment to anterior edge of gill opening), caudal 61.5–69.5, snout 6.76–7.7, postorbital 10.8–11.5 (to dorsal edge of gill opening), orbit 4.00–4.23, all in percentage of length (tip of tail to tip of coronet with snout at right angle to caudal).

First caudal segment usually quadrangular, two hexangular; last trunk segment usually septangular, one octangular (female); penultimate trunk segment septangular; lower lateral ridge on last trunk segment incomplete on one side, making it asymmetrical with seven bony plates (female); the lateral plate is present with a total of eight bony plates. Two specimens have septangular last trunk segment with hexangular first caudal segment. These two specimens have nine trunk segments instead of the usual ten.

*Color* (in alcohol).—General color light brownish or pale with irregular dark mottling; fins pale, dorsal fin with a dusky submarginal streak.

*Remarks.*—The last trunk segment is usually septangular in the Bermuda specimens; however, those from Florida have the last trunk segment usually octangular. Also, the penultimate trunk segments are hexangular, while those from Florida are nearly always septangular. The known range of *H. zosteræ* extends from Biscayne Bay to Pensacola and now includes Bermuda.

### Family POLYNEMIDAE

#### *Polydactylus virginicus* Linnaeus.

*Polynemus virginicus* Linnaeus, 1758, Syst. Nat., ed. 10, 1: 317—Americas.

*Bermuda record.*—C.N.H.M. no. 48743, White Flat, at night, July 14, 1909; collector L. L. Mowbray; standard length 36.5 mm.

*Description.*—Dorsal fin rays VIII–I, 13; anal III, 14; ventrals I, 5; pectorals 15; pectoral filaments 7; gill-rakers on first arch, 10 on upper limb, 15 on lower; scales in lateral line 60.

Greatest depth of body 3.84, length of head 3.17, tip of snout to origin of dorsal fin 4.56, all in standard length; snout 5.75, eye 3.84, postorbital length 1.92, longest pectoral ray 1.64, longest pectoral filament 0.96, upper jaw 2.09, all in length of head; length of gill-rakers 1.5 in diameter of eye.

Body moderately elongate, compressed; scales ctenoid, head and cheeks scaled; teeth present on jaws, vomer and palatine in villiform

bands; snout conical, projecting beyond mouth; posterior margin of preopercle serrate, a small spine at lower angle; lateral line complete, branching at caudal fin; origin of first dorsal fin in advance of ventrals, first spine very short, third longest; origin of second dorsal slightly in advance of anal, highest anteriorly; ventral fins short; pectoral filaments long, reaching origin of anal fin; caudal fin deeply forked.

*Color* (in alcohol).—General color brown, dusky dorsally, paler laterally; punctuated with brown spots dorsally, less dense laterally; dorsal and caudal fins more or less punctuated; anal, ventral, and pectoral fins translucent.

*Remarks*.—The known range of this species is Florida, the West Indies, possibly Brazil, and now Bermuda.

#### Family BRAMIDAE

#### *Collybus drachme* Snyder.

*Collybus drachme* Snyder, 1902, Bull. U. S. Fish Comm., 22: 525, pl. 9, fig. 16—Hawaii.

*Bermuda record*.—C.N.H.M. no. 48931, Challenger Bank, surface, January, 1917; collector L. L. Mowbray; standard length 41.5 mm.

*Description*.—Dorsal fin rays IV, 30; anal I, 28; pectorals 19; ventrals I, 5; scales in lateral series 56; gill-rakers on lower first arch 10.

Greatest depth of body 1.67, length of head 3.32, tip of snout to origin of dorsal fin 2.18, tip of snout to origin of anal fin 1.60, length of dorsal base 1.84, length of anal base 1.97, length of pectoral fin 3.04, length of ventrals 7.55, all in standard length; snout 5.00, diameter of eye 2.41, interorbital width 3.13, upper jaw 1.79, length of caudal peduncle 2.5, depth of caudal peduncle 3.58, all in length of head.

Body greatly compressed, lower profile of head more convex than upper profile, angle of upper profile 50°, lower 70° (angle formed by slope of head and a straight line drawn through axis of body); mouth nearly vertical, lower jaw projecting beyond upper jaw, posterior margin of maxillary reaching a vertical through anterior margin of pupil of eye; teeth in jaws weak, conical, in two or three rows, four thin canine-like teeth anteriorly on lower jaw; no teeth on vomer and palatine; scales on body with a high vertical ridge in the middle and a knob in the center, the ridges hidden by the overlapping softer part but the knob exposed; scales (exposed part) short, about one-third

the vertical length, scales on head, breast, caudal peduncle and dorsal part of body smaller; nape, snout, premaxillary, lower jaw and chin naked, covered with minute pores; premaxillary not protractile; lateral line absent; ventral fins short, base below pectoral fin base; dorsal fin longer than distance from tip of snout to origin of dorsal fin; origin of anal fin equidistant from tip of snout to posterior edge of anal fin.

*Color* (in alcohol).—General color light brown, fins pale, lobes of caudal fin dusky, distal end of fourth to sixth dorsal rays with a dusky blotch.

*Remarks*.—This specimen agrees with the description by Snyder (1902, p. 525) of specimens from Hawaii. This is the first record of this genus for the Atlantic and the third ever recorded; the other two are from the Hawaiian Islands. This form may be the young of *Brama raii* Bloch.

#### Family SERRANIDAE

##### *Prionodes tabacarius* Cuvier and Valenciennes.

*Centropristes tabacarius* Cuvier and Valenciennes, 1829, Hist. Nat. Poiss., 3: 44—Martinique.

*Bermuda record*.—C.N.H.M. no. 48657, Flatts Inlet, after north-west gale, January 16, 1935; collector L. L. Mowbray; standard length 118 mm.

*Description*.—Dorsal fin rays X, 12; anal rays III, 7; pectorals 15; ventrals I, 5; branched caudal rays 8 in upper lobe, 7 in lower; scales in lateral series 88; gill-rakers on first gill arch, 8 on upper branch, 17 on lower (including rudiments).

Greatest depth of body 3.69, length of head 2.60 (including opercular membrane), length of dorsal fin base 2.02, length of anal fin base 5.25, all in standard length; snout 3.87, diameter of eye 3.87, postorbital length 2.07, interorbital 5.81, upper jaw 2.32, length of caudal peduncle 1.86, depth of caudal peduncle 3.21, longest pectoral ray 2.21, longest ventral ray 1.98, all in length of head.

Body moderately elongate, profile of head slightly convex, interorbital concave; eyes large, diameter equal to length of snout; upper jaw reaching a vertical through middle of eye; teeth in upper jaw in bands, those on front edge enlarged, spaced at symphysis; teeth in narrower band in lower jaw; margin of preopercle serrated; three spines on posterior edge of opercle, middle spine largest; origin of dorsal fin above posterior margin of opercular membrane, fifth spine

longest, almost four times length of first spine; third anal spine longest, a little longer than diameter of eye; ventrals inserted a little anterior to pectoral base; caudal fin lunate; ventral fins not reaching anal origin; ctenoid scales on body small, scales on cheek in eleven rows.

*Color* (in alcohol).—General color brown, lighter laterally and ventrally; seven small light blotches along dorsal part of head and body: two on head, one predorsal, three below base of dorsal fin and last on upper caudal fin base. Head and breast dusky; fins pale, lobe of caudal fin with a dusky streak, a dark spot on the anterior three spines of the dorsal fin.

*Remarks*.—The known range of this species is now from the West Indies to Bermuda.

### Family PSEUDOCHROMIDAE

*Rhegma bermudensis* sp. nov. Figure 11; Table 1.

*Type*.—C.N.H.M. no. 48924, Bermuda, south side beaches, specimens washed ashore during heavy storm and high seas. August 20–21, 1933; collectors L. S. Mowbray and Herbert Outerbridge; standard length 34.5 mm.

*Paratypes*.—C.N.H.M. no. 48924, data same as type; standard lengths 23–27 mm. (4 specimens). C.N.H.M. no. 49128, Bahamas, Turk Island, July, 1916; collector L. L. Mowbray; standard length 38 mm.

*Diagnosis*.—Dorsal fin with pungent spines VII or VIII, 19; anal rays III, 16. Scales in lateral series 40–42, scales between origin of first dorsal spine to lateral line 5, scales between anus and lateral line 18–19; supraocular flap present; lateral line incomplete (does not appear on caudal peduncle); pectorals long, reaching past origin of anal fin; caudal peduncle 3.80–4.07, diameter of eye 4.35–4.67, both in length of head; length of head 2.30–2.46 in standard length; interorbital space 2.88–3.28 in diameter of eye. A pair of large pores next to eye in interorbital space.

*Description* (characters of paratypes in parentheses).—Dorsal fin with pungent spine VIII, 19 (VII, 19); anal rays III, 16 (III, 16); pectorals 14 (14); ventrals I, 5 (I, 5); branched caudal rays 15 (15–16); gill-rakers on first arch 5+1+9 (5+1+9); scales in lateral series 42 (40–41); scales between origin of first dorsal spine and lateral line 5 (5); scales between anus and lateral line 18 (18–19).

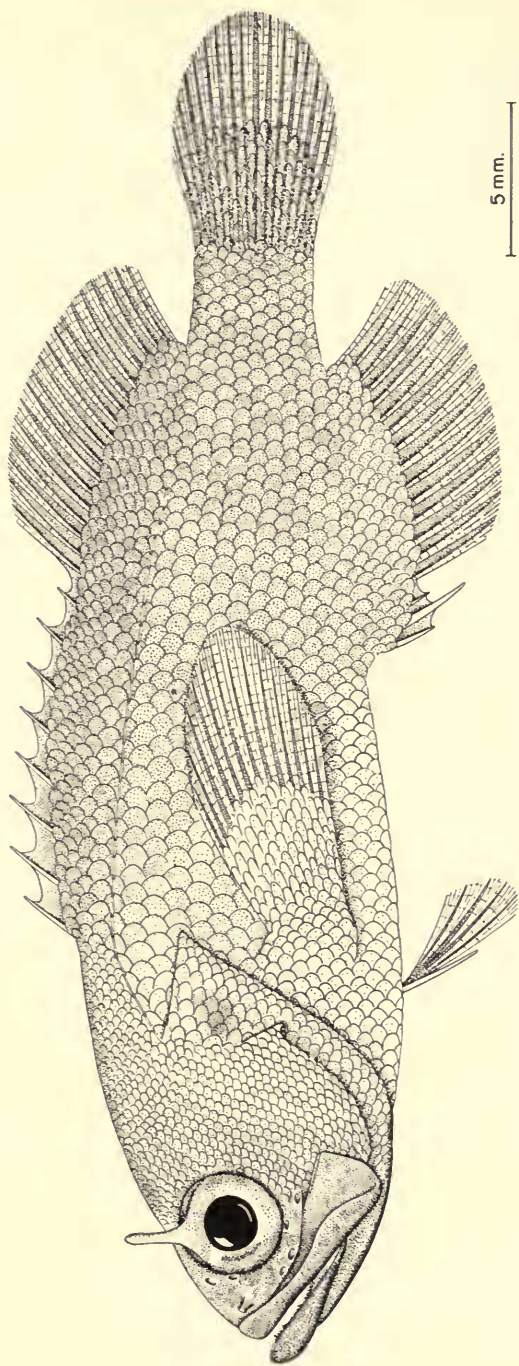


FIG. 11. *Rhagma bermudensis* sp. nov., type; C.N.H.M. no. 48924; standard length 34.5 mm.

Depth of body 3.45 (3.47–3.60), length of head 2.46 (2.30–2.45) (tip of snout to posterior edge of opercular membrane), tip of snout to origin of dorsal fin 2.46 (2.36–2.45), tip of snout to origin of anal fin 1.50 (1.44–1.50), length of dorsal fin base 1.77 (1.73–1.84), length of anal fin base 4.02 (3.83–3.97), tip of snout to anus 1.68 (1.59–1.64), all in standard length; width of head 2.55 (2.44–2.86), snout 5.60 (5.50–6.66), eye 4.67 (4.35–4.55), postorbital space 1.75 (1.67–1.77), upper jaw 2.16 (2.20–2.27), length of caudal peduncle 4.00 (3.67–4.16), depth of caudal peduncle 4.00 (3.80–4.07), length of caudal fin 1.64 (1.67–1.69), longest dorsal rays 2.52 (2.20–2.86), longest anal ray 2.34 (2.75–2.86), length of pectorals 1.40 (1.11–1.54), length of ventrals 2.80 (3.67), shortest dorsal spine 5.59, longest dorsal spine 4.37, all in length of head; interorbital space 3.00 (2.88–3.28) in diameter of eye (see Table 2 for measurements expressed in thousandths of standard lengths).

Body moderately elongate, compressed; dorsal profile of head slightly convex; mouth terminal, oblique, lower jaw projecting slightly beyond upper jaw, a thin supramaxillary present, maxillary reaching past posterior margin of eye; teeth in jaws small, conical, depressible, in narrow band; teeth on vomer and palatine also in narrow bands; a triangular supraocular flap (about diameter of pupil); a pair of large pores next to eye on interorbital space; opercle with three broad blunt spines imbedded; preopercle with a single broad spine at angle pointed downward; ventrals short, base anterior to pectoral base; pectorals long, reaching past origin of anal fin, base below origin of dorsal fin; dorsal fin base long, membrane between spines not deeply incised, first spine shortest, the third longest; second anal spine longest; caudal fin rounded; lateral line single, incomplete, curved upward anteriorly, then following dorsal contour, ending near middle of soft dorsal fin; no lateral line on caudal peduncle; scales on body and cheek, absent on both jaws, chin, and snout.

*Color* (in alcohol).—In general color bluish brown; anterior part of head to posterior margin of eye dusky; snout, upper and lower jaws dusky; paired fins pale; vertical fins darker; a large black spot on opercles (faded).

*Remarks*.—This species belongs to the genus *Rhegma* as defined by Schultz in his key to the genera of Pseudochromidae (Schultz, 1943, p. 111). This relationship is shown by the following characters: dorsal spines pungent, VII, 15 to 24; anal III, 12 to 20; membrane between dorsal spines not deeply incised; a dermal flap located

TABLE 1.—COUNTS MADE ON RHEGMA BERMUDENSIS AND R. THAUMASIUM

	Dorsal fin					Spines	Anal fin							
	VII	VIII	19	20	21		22	23	24	III	6	3	13	7
<i>bermudensis</i> .....	5	1	6	..	..	..	..	..	..	..	..	..	..	..
<i>thaumastium</i> .....	23	1	..	3	12	5	2	2	..	24	3	13	7	1

	Pectoral fin					Scales from lateral line to anus								
	14	15	16	17	18	18	19	20	21	22	23	24	25	26
<i>bermudensis</i> .....	6	..	..	..	..	6	..	..	..	..	..	..	..	..
<i>thaumastium</i> .....	..	..	16	7	2	12	8	2	..	1	6	5	2	4

	Scales from upper edge of gill opening to caudal fin base					Gill-rakers										
	40	41	42	43	44	45	46	47	48	49	50	51	52	Above	At angle	Below
<i>bermudensis</i> .....	3	2	1	..	..	..	..	..	..	..	..	..	..	6	..	6
<i>thaumastium</i> .....	..	..	..	..	..	..	..	..	2	5	4	5	6	22	2	24

dorsally on each eye; a pair of large pores next to eye in interorbital space. In addition the dorsal spines are either VII or VIII and the scales in lateral series 40-55.

This species differs from all other members of this genus by having fewer scales in the lateral series. It differs further from *Caribrhegma gregoryi* Breder (1927), which has fewer rays in the dorsal and anal fins (dorsal VII, 15; anal III, 12) and has the lateral line present on the mid-caudal peduncle. *R. bermudensis* is closest to *thaumasium* Gilbert (*in* Jordan and Evermann, 1900); however, it differs in the following characters: in *thaumasium* the lateral line appears on the caudal peduncle (in some young specimens of *thaumasium* the lateral line on the caudal peduncle is absent), the pectorals are shorter with more rays, there are more scales between the first dorsal and the lateral line and between the anus and the lateral line, the caudal peduncle is deeper, there are more dorsal and anal fin rays, the head is shorter, the eye smaller and the interorbital wider. Table 1 shows the various counts of *bermudensis* and *thaumasium*.

Schultz (1943) has placed *R. guineensis* Norman (1935; Gulf of Guinea) and *R. brederi* Hildebrand (*in* Longley and Hildebrand, 1940; Tortugas) in the genus *Pseudogramma*, which lacks the dermal flap on the eye; Myers (1935) places the genus *Rhegma* in synonymy with *Pseudogramma*.

#### KEY TO SPECIES OF GENUS RHEGMA

- 1a. Soft dorsal rays 15, soft anal rays 12 (Caribbean, Glover Reef).  
*gregoryi* Breder
- 1b. Soft dorsal rays 19-24, soft anal rays 16-20.
  - 2a. Pectoral rays 16-18, scales in lateral series 47-52, scales from lateral line to anus 20-26 (Pacific, Panama; Colombia, Gorgona Island).....*thaumasium* Gilbert
  - 2b. Pectoral rays 14, scales in lateral series 40-42, scales in lateral line to anus 18-19 (Bermuda, Bahamas).....*bermudensis* sp. nov.

#### Family CEPOLIDAE

##### *Cepola* sp.

*Bermuda record*.—C.N.H.M. no. 49184, Challenger Bank, from stomach of grouper caught at depth of 40 fathoms, March, 1908; collector L. L. Mowbray; standard length 232 mm. (condition poor).

*Description*.—Dorsal rays 78?; anal fin rays 66?; pectorals 16; ventrals I, 5; gill-rakers on lower limb of first arch 29.

Depth 14.06, length of head 9.88, length of caudal fin 6.11, length of dorsal fin base 1.14, length of anal fin base 1.22, tip of



snout to origin of dorsal fin 10.79, tip of snout to origin of anal fin 5.80, all in standard length; snout 7.13, diameter of eye 2.87, inter-orbital width 6.72, length of upper jaw 2.10, length of pectoral fin 1.88, length of ventral fin 1.81, depth of caudal peduncle 11.75, length of gill-rakers 4.70, all in length of head.

Body compressed and elongate; mouth terminal, strongly oblique, upper jaw reaching a vertical from posterior margin of eye, hind margin of maxillary broad, more than one-half diameter of eye; teeth in jaws wide set, uniserial, slender, conical, recurved on distal end, 24 teeth on mandible, 17 on right half of maxillary; teeth on vomer and palatine apparently absent; preopercle entire; posterior margin of opercle ending in a blunt point; pseudobranchiae present; scales cycloid, very small; origin of dorsal fin above dorsal opercular margin; tip of snout to origin of anal fin a little more than twice the distance from tip of snout to origin of dorsal fin; dorsal and anal fins high, reaching caudal fin; ventral fin insertion below vertical from anterior part of pectoral base.

*Color* (in alcohol).—General color light brown and all fins pale.

*Remarks*.—The specimen had been broken into five parts, and its condition is such that the species cannot be determined with certainty. The description resembles the genus *Cepola* as characterized by Günther (1861, p. 486). The dorsal and anal fin ray counts calculated, dorsal fin 7 rays per 20 mm., anal fin rays 9 per 26 mm. Our specimen appears to be close to *C. rubescens* (Mediterranean and British coast); however, the fin counts of *rubescens* are 67–69 for the dorsal fin and 60 for the anal fin.

This genus is reported from the seas of China and Japan, the British coast and the Mediterranean, and now from the Bermuda area.

### Family DACTYLOSCOPIDAE

#### *Dactyloscopus tridigitatus* Gill.

*Dactyloscopus tridigitatus* Gill, 1859, Proc. Acad. Nat. Sci. Phila., 11: 132—Barbados.

*Bermuda record*.—C.N.H.M. no. 48707, Castle Harbor, by dredge, June 20, 1908; collector L. L. Mowbray; 2 specimens, standard lengths 63 mm. and 52 mm.

*Description*.—Dorsal fin rays XI, 28 to 29; anal rays II, 30 to 31; pectoral rays 13 to 14; ventrals I, 3; opercular fringe filaments 12 to 14; scales on lateral line 43 to 45.

Depth of body 5.47–6.30, length of head (including opercular filament), 3.25–3.50, both in standard length; snout 6.40–7.20, width of head 1.64–1.68, tip of snout to origin of dorsal fin 1.44–1.48, tip of lower jaw to anus 1.00–1.09, length of pectorals 1.25–1.52, all in length of head.

Body elongate, compressed, slender, somewhat rounded anteriorly, tapering gradually from behind nape to tail; head cuboid, angle of snout oblique, lower jaw projecting beyond upper jaw, upper and lower lips fringed with small filaments; teeth in jaws conical, in bands; a single tubular nostril on each side of snout; eye stalked; lateral line complete, anteriorly close to dorsal fin, curving down from eleventh scale to midline; origin of dorsal fin anterior to gill opening; origin of anal fin below fifth dorsal spine; insertion of ventral fin anterior to origin of dorsal fin; pectoral fins large and strong, lower rays shortest and upper rays longest, distal ends of rays curved upward; scales cycloid, large; naked on head, breast, and abdomen.

*Color* (in alcohol).—General color whitish, all fins translucent.

*Remarks*.—Bermuda specimens have eleven spines in the dorsal fin while those from Panama and Puerto Rico have twelve. The known range of this species extends from the West Indies to Florida and now Bermuda.

**Gillellus greyae** sp. nov. Figure 12.

*Gillellus semicinctus* Longley and Hildebrand (in part), 1941, Papers from Tortugas Laboratory, 34: 245–246 (5 specimens).

*Type*.—U.S.N.M. no. 116881, Florida, Tortugas; collector W. H. Longley; standard length 48 mm.

*Paratypes*.—U.S.N.M. no. 160658, data same as type (4 specimens); standard lengths 37–62.5 mm. U.S.N.M. no. 88113, Florida, Tortugas, June to August, 1926; collector W. H. Longley; standard length 36.5 mm. U.S.N.M. no. 82551, Cuba, reef at Lavesos Italianos opposite Cayo Lavesa, June 2, 1914; Tomas Barreras Expedition, collectors J. B. Henderson and Paul Bartsch; standard length 42.5 mm. C.N.H.M. no. 48719, Bermuda, Building Bay, tide pool, July 1, 1908; collector L. L. Mowbray; standard length 37 mm.

*Diagnosis*.—Dorsal fin rays III–XVI to III–XVIII, 19 to 26; anal fin rays II, 28 to 33; scales in lateral line 52–57; scales absent on abdomen and nape; ocular cirrus present; lower jaw reaches a vertical from posterior margin of eye.

*Description* (characters of paratypes in parentheses).—Dorsal fin rays III-XVI, 21 (III-XVI to III-XVIII, 19 to 26); anal rays II, 31 (II, 28 to 33); pectoral rays 13 (13-14); ventral rays I, 3; scales in lateral line 52 (52-57); transverse scale rows 12.

Depth of body 6.0 (5.21-6.86), length of head (tip of snout to upper edge of gill opening) 4.36 (4.21-4.47), tip of snout to origin of dorsal fin 5.65 (5.21-5.69), tip of snout to origin of anal fin 3.00 (2.71-3.05), length of dorsal fin base 1.31 (1.24-1.32), length of anal fin base 1.52 (1.49-1.64), all in standard length; width of head 1.37 (1.33-1.54), snout 6.11 (5.31-6.30), length of orbit 5.00 (4.72-5.60),

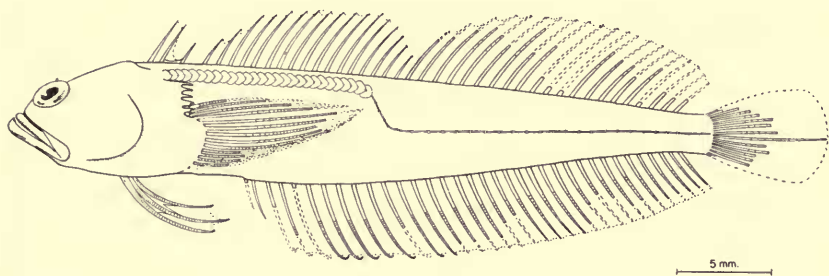


FIG. 12. *Gillellus greyae* sp. nov., paratype (partial restoration); C.N.H.M. no. 48719; standard length 37 mm.

upper jaw 2.20 (2.33-2.66), length of caudal fin 1.57 (1.42-1.87) longest dorsal spine 2.44 (2.38-2.80), longest soft dorsal ray 1.83 (1.69-2.11), all in length of head; interorbital 3.14 (2.50-6.00) in diameter of eye (see Table 2 for measurements expressed in thousandths of standard lengths).

Body moderately elongate, compressed, gradually tapering to caudal fin; dorsal fin base long, first three spines separated from continuous dorsal spines by a space, the third spine shortest, about equally distant from the first continuous dorsal spine and the second anterior spine; the first three spines connected by a membrane, but no membrane between the third spine and the first continuous spine; the spinous dorsal fin separated from the soft dorsal fin by a notch; anal fin below eleventh scale of lateral line, ventral fin base below posterior preopercle; head bluntly conical, posterior part of head deepest, mouth superior, oblique, maxillary reaching a vertical from posterior margin of eye, lower jaw bluntly pointed, projecting beyond upper jaw, filaments on upper lip obsolete, those on lower lip few toward anterior part of lip; teeth on lower jaw conical,

slightly curved, uniserial on lateral jaw, biserial on upper jaw, teeth absent on vomer and palatine; eyes superior, entering profile, a single small ocular cirrus; opercular membrane covering base of pectoral; scales on body cycloid; abdomen, head and nape naked; lateral line complete, following dorsal contour anteriorly and abruptly curving to midline from twenty-third to twenty-eighth scales.

*Color* (in alcohol).—General color light brown with all fins pale. In two specimens six or seven saddle marks present on upper body, with whitish spots on darker background.

*Remarks*.—This species belongs to the genus *Gillellus* as defined by Gilbert (1890, p. 98) in the following characters: on the nape a separate dorsal fin composed of three spines, lateral line descending posteriorly, fringes of upper lip obsolete, those of lower lip few, head not cuboid, mouth moderately oblique, lower lip moderately rounded and without symphyseal flap.

*Gillellus greyae* must be distinguished from other members of this genus by the high lateral line count. It may be further differentiated by the characters as shown in the following key.

KEY TO SPECIES OF GENUS GILLELLUS  
FROM WESTERN ATLANTIC

- 1a. Abdomen and nape scaled, 4 broad bands on body (Florida, British West Indies).....*rubrocinctus* Longley<sup>1</sup>
- 1b. Abdomen and nape without scales, more than 5 bands on body.
  - 2a. No deep notch separating second spinous dorsal and soft dorsal fin, head compressed, bluntly pointed; dorsal fin III-IX to X, 27 to 30; scales in lateral line 47-49 (Gulf of Mexico, Florida).  
*semicinctus* Gilbert
  - 2b. A deep notch separating second spinous dorsal and soft dorsal fin, head more cuboid; dorsal fin III-XVI to XVIII, 19 to 26; scales in lateral line 52-57 (Bermuda, Florida, Cuba).  
*greyae* sp. nov.

This species has been named *greyae* for Mrs. Marion Grey, Associate, Division of Fishes, Chicago Natural History Museum, one of the members of the Bermuda Deep Sea Expedition of 1948.

Family CLINIDAE

*Malacoctenus macropus* Poey.

*Myxodes macropus* Poey, 1868, Synopsis, 3: 399—Havana.

<sup>1</sup>*Gillellus quadrocinctus* Beebe and Hollister (1935, Zoologica, 19, no. 6: 222-224), from the British West Indies, Grenadines, Union Island, is a synonym.

*Bermuda records.*—C.N.H.M. no. 48713, Castle Harbor, Long Bird side, in pools and old corals, June 16, 1908; collector L. L. Mowbray; 7 specimens, standard lengths 13 to 25.5 mm.

*Description.*—Dorsal fin rays XXI to XXII, 9 to 11; anal II, 20 to 21; pectorals 15–16; scales of lateral line 42–44.

Greatest body depth 3.43–4.19, length of head 3.16–3.40, both in standard length; snout 3.43–4.00, eye 3.00–3.46, upper jaw 3.00–3.31, depth of caudal peduncle 3.40–3.80, length of pectoral 0.94–1.09, length of ventrals 0.94–1.20, first dorsal spine 2.00–2.17, longest dorsal ray 1.27–1.52, longest anal ray 2.32–2.83, tip of snout to origin of dorsal fin 1.07–1.25, all in length of head (tip of snout to posterior margin of opercular membrane).

Body relatively stout, compressed, greatest depth just behind head; profile slightly convex; head and snout short; maxillary reaching anterior margin of eye; supraocular and nasal cirrus present, one or two cirri on nape; teeth in outer series conical, a few villiform teeth behind outer series; teeth present on vomer, absent on palatines; gill membranes united, free from isthmus; origin of dorsal fin above upper end of gill-opening, soft dorsal rays longer than spinous dorsal rays; ventrals long, reaching past origin of anal fin; cycloid scales on body; lateral line complete, arched anteriorly, abruptly curving down from eleventh dorsal spine to mid-body.

*Color* (in alcohol).—General color light brown, body crossed by nine or ten irregular bars, extending partially onto dorsal fin, bars becoming indistinct and paler on lower half of body, first four bars broad, others narrow and irregular; pectoral and ventral fins translucent; spinous dorsal with scattered brown spots; caudal and soft dorsal translucent; anal fin membranes punctuated with small brown spots becoming paler along base; head brown, punctuated with fine dusky spots, lower half paler, interspaced with light areas.

*Remarks.*—These specimens resemble the description of *M. moorei* Evermann and Marsh (1900, p. 309); however, Longley and Hildebrand (1941, p. 247) have placed *moorei* in synonymy with *M. macropus* Poey.

The known range of this species is from the West Indies and Florida to Bermuda.

### **Malacotenus bimaculatus** Steindachner.

*Clinus bimaculatus* Steindachner, 1876, Sitzber. Akad. Wiss. Wien (M.-N.), 74, Abth. 1: 180—*islands off Cuba.*

*Bermuda record*.—C.N.H.M. no. 48711, Castle Harbor, June 16, 1908; collector L. L. Mowbray; standard length 23.5 mm.

*Description*.—Dorsal rays XX, 10; anal rays II, 20; pectorals 14; scales in lateral line 44.

Depth of body 3.92, length of head (including opercular membrane) 2.94, tip of snout to origin of dorsal fin 3.36, tip of snout to origin of anal fin 1.88, all in standard length; snout 3.63, diameter of eye 3.33, interorbital width 8.90, length of upper jaw 3.47, length of caudal peduncle 3.33, depth of caudal peduncle 4.00, length of caudal fin 1.33, longest soft dorsal ray 1.70, longest pectoral ray 1.14, longest ventral ray 1.07, all in length of head.

Body relatively stout, compressed, head moderately pointed, large eye entering into dorsal profile; mouth terminal, slightly oblique, maxillary reaching past a vertical through anterior margin of eye; teeth in jaws conical, uniserial; teeth present on vomer and absent on palatine; about five cirri on nape, two supraocular cirri and a single nasal cirrus; gill membranes broadly united, free from isthmus; dorsal fin base long, origin anterior to opercular opening, fourth spine shortest and forming a slight notch, soft dorsal rays longer than spinous dorsal rays; ventral fins long, reaching past origin of anal fin; caudal fin rounded; lateral line complete, curving down to midline below last dorsal spine, then proceeding straight to caudal fin base; scales on body cycloid, head naked.

*Color* (in alcohol).—Body light tan with seven vertical bars extending onto vertical fins, anterior three bars wide, posterior four bars consisting of spots, fourth bar of four spots extending dorsally and embracing a large nucleated spot extending onto posterior dorsal spines; two large brown spots on dorsal fin, anterior spot covering the first four spines and a posterior nucleated spot covering the last four spines; soft dorsal and caudal fins with brown spots; brown submarginal streak on anal fin; paired fins translucent; head lighter than body, with two thin vertical bars on jaws and two vertical bars below eye.

*Remarks*.—This species has been reported from Cuba, Andros Island, and now from Bermuda.

#### Family BLENNIIDAE

#### **Blennius marmoreus** Poey.

*Blennius marmoreus* Poey, 1875, Enumeratio: 130—Cuba.

*Bermuda record*.—C.N.H.M. no. 48555, White Flat, February 24, 1932; collector L. S. Mowbray; standard length 54.5 mm.

*Description*.—Dorsal fin rays XII, 19; anal rays II, 21; pectorals 14; ventrals I, 2; supraocular cirri 7 on single base; nasal cirrus 1.

Depth of body (at origin of dorsal fin) 4.74, length of head (to posterior margin of opercular membrane) 3.52, width of head 1.72, tip of snout to origin of dorsal fin 4.55, tip of snout to origin of anal fin 2.02, tip of snout to vent 2.22, length of dorsal fin base 1.28, length of anal fin base 2.10, all in standard length; length of snout 3.44, eye 4.43, postorbital length 1.55, upper jaw 2.58, depth of caudal peduncle 4.43, longest dorsal fin ray 1.72, longest anal ray 2.38, longest pectoral ray 1.29, longest ventral fin ray 1.55, length of caudal fin 1.48, all in length of head; interorbital space 3.5 in diameter of eye.

Body elongate, compressed, dorsal profile of head steep, with an angle of  $56^\circ$  (angle formed by profile with a straight line drawn through axis of body), eye entering into upper profile, angle of lower profile  $28^\circ$ ; mouth terminal, horizontal; maxillary wide, posterior edge reaching a vertical through posterior margin of pupil of eye; teeth in jaws comb-like, in a single series with a large curved canine on each end; vomer and palatine toothless; ventrals jugular, base anterior to pectoral base, below origin of dorsal fin; pectoral fins reaching eleventh dorsal spine; caudal fins rounded; first two anal spines bearing spherical fleshy bulbs with longitudinal rugose lamellae; gill membranes united, forming a narrow fold across isthmus; lateral line incomplete, ending below eleventh dorsal spine; body scaleless.

*Color* (in alcohol).—General color olivaceous, finely reticulated, black spots along middle of sides; mouth greenish; fins pale, distal end of anal fin dusky, edged with white; a dusky spot on membrane between first and second dorsal spines.

*Remarks*.—The known range of this species is from Venezuela and the West Indies to Florida and now Bermuda.

#### Family MICRODESMIDAE

*Microdesmus woodsi* sp. nov. Figure 13.

*Type*.—C.N.H.M. no. 48876, Bermuda, St. David's Island, Sink, July, 1906; collector L. L. Mowbray; standard length 145 mm.

*Diagnosis*.—Vent midpoint between tip of snout and base of mid-caudal fin ray; dorsal rays 71; anal 44; pectoral rays 13; vertebrae 63;

depth of body 19.3, vent to base of mid-caudal fin 2.00, preventral 13.2, predorsal 9.01, length of head 14.5, all in standard length; snout 5.56 in length of head; upper edge of gill opening opposite upper pectoral ray.

*Description.*—Dorsal fin rays 71; anal 44; pectoral rays 13; ventral I, 3; vertebrae 63 (X-ray count).

Depth of body 19.3, length of head (to posterior end of gill opening) 14.5, tip of snout to origin of anal fin 1.99, tip of snout to origin of dorsal fin 9.01, tip of snout to anterior base of ventral fin 13.2, tip of snout to vent 2.00, vent to mid-caudal fin base 2.00, all in standard length; snout 5.56, eye 10.00, interorbital space 10.00, upper jaw



FIG. 13. *Microdesmus woodsi* sp. nov., type; C.N.H.M. no. 48876; standard length 145 mm.

3.34, length of pectoral fin 1.82, length of ventral fin 1.82, length of caudal fin 1.00, width of gill opening 4.77, all in length of head (see Table 2 for measurements in thousandths of standard length).

Body elongate, compressed; tail without caudal fin as long as rest of body; head blunt, fleshy tip of lower jaw strongly projecting, lips with lateral flanges (lateral flanges of lower lip not folded downward as in other species; however, this may be due to the poor condition of the specimen), mouth moderately oblique, gape not reaching a vertical from anterior margin of eye; teeth in jaws small, in two irregular series; teeth absent on vomer and palatine; anterior nostril a minute pore at oral end of outer frontal ridge, posterior nostril a small round opening above and just before eye; eye small, a little more than one-half length of snout; interorbital about diameter of eye; gill opening restricted to side, extending from opposite base of upper third pectoral ray obliquely downward and forward to a little below last pectoral ray, a little wider than pectoral base; vertical fins long, continuous with caudal fin; origin of dorsal fin above posterior edge of pectoral fin; ventral fin base below base of pectoral fin; several radiating ridges around eye, on cheek and on dorsal surface of head.

*Color* (in alcohol).—The general color is olivaceous brown with fins pale.



*Remarks.*—This species belongs to the genus *Microdesmus* as defined by Reid (1936) in his revision of the family Microdesmidae. Body elongate; head short, mouth small, lips with lateral flange; well-developed vertical fins united with caudal fin, ventral fins small; teeth in jaws in two irregular series, absent on vomer and palatines; lateral line absent; vertebrae numerous.

This species may be distinguished from all others of this genus by the number of vertebrae, the number of dorsal and anal rays, and the position of the vent. The position of the vent is used as a primary division by Reid in his revision; however, I agree with Myers and Wade (1946, p. 165) that this character remains questionable as a primary division. *M. reidi* Myers and Wade (1946) from Baja California also has the vent very near the midpoint between the snout and the caudal base; however, it may readily be separated from this species by the dorsal and anal fin ray counts. *Microdesmus woodsi* is closely related to *longipinnis* Weymouth from Louisiana and *affinis* Meek and Hildebrand from Panama; however, it differs in the following characters:

	<i>woodsi</i>	<i>affinis</i>	<i>longipinnis</i>
In standard length:			
Greatest depth.....	19.3	16.8	28.3-34.4
Length of head.....	14.5	10.5	—
Snout to anus.....	2.0	—	1.3
Preventral length.....	13.2	10.1	15.5-15.9
Predorsal length.....	9.01	7.4	—
In length of head:			
Length of snout.....	5.56	—	6.4-8.1
Position of anus.....	Midpoint	Posterior half of body	Anterior half of body
Position of gill opening in relation to pectoral fin base.....	Upper pectoral rays	Middle pectoral ray	—

This species is named *woodsi* for Loren P. Woods, Curator of Fishes, Chicago Natural History Museum, who was one of the leaders of the Bermuda Deep Sea Expedition of 1948.

### Family GOBIESOCIDAE

#### *Cotylin nigripinnis nigripinnis* Peters.

*Cotylin nigripinnis nigripinnis* Peters, 1860, Monatsb. Akad. Wiss. Berlin, 1859: 412—Puerto Cabello, probably Venezuela.

*Bermuda record.*—C.N.H.M. no. 48586, Bermuda, 1911; collector L. L. Mowbray; 2 specimens, standard lengths 46 mm. and 34 mm.

*Description.*—Dorsal fin rays 11, anal 9, pectorals 24, upper edge of gill membrane attached opposite upper edge of seventh pectoral fin ray.

Greatest depth of body 4.85–5.75, length of head 2.30–2.34, width of head 2.14–2.43, length of dorsal fin base 3.58, length of anal fin base 5.66–5.75, length of disk 2.79–2.83 (anterior margin of disk membrane to posterior margin), tip of snout to origin of dorsal fin 1.48, tip of snout to origin of anal fin 1.36–1.39, all in standard length; snout 2.86–3.22, diameter of eye 5.80–6.66, interorbital width 2.90–3.34, postorbital width 1.71–1.78, origin of anal fin to anus 7.25–10.0, posterior margin of disk to anus 3.63–5.00, all in length of head.

Body naked, posterior part of body compressed, head depressed; groove between tip of snout and upper lip of premaxillary arched dorsally over tip of snout, short blunt papillae on lips and around mouth; three pairs of incisor-like teeth in anterior part of lower jaws in outer row, anterior teeth of upper jaw nearly conical, lateral teeth of both jaws conical; a small patch of teeth behind outer teeth in front of both jaws; interorbital space wide and flat; anterior nostrils tubular, with dermal flaps; shoulder girdle with a fleshy lobe a little smaller than the pectoral fin and continuous with the ventral disk; base of pectoral with a fleshy lobe, posterior and ventral edges free; papilla present on anterior part of disk; pelvic fins attached near base of pectoral fin; lower rays of pectoral nearly as long as middle rays of pectoral; anus closer to anal fin than to posterior edge of disk.

*Color* (in alcohol).—General color brown, paler ventrally; median fins dusky brown, membranes with brown spots, caudal fin pale posteriorly, pectoral fins pale.

*Remarks.*—The known range of this species extends from Chesapeake Bay to Brazil, the West Indies and Bermuda.

### Family TRIACANTHIDAE

#### *Hollardia hollardi* Poey.

*Hollardia hollardi* Poey, 1861, *Memorias*, 2: 348, pl. 18, fig. 11—Cuba.

*Bermuda record.*—C.N.H.M. no. 48585, Bermuda, 1911; collector L. L. Mowbray; standard length 50 mm.

*Description.*—Dorsal rays VI, 17; anal 15; pectoral 14; ventral I, 2; caudal 6–6 (branched rays); teeth on upper jaw 14, lower 16.

Greatest body depth 1.47, length of head 2.50, tip of snout to origin of dorsal fin 1.72, tip of snout to origin of anal fin 1.31, length

of dorsal fin base 1.85, length of anal fin base 5.26, origin of dorsal fin to mid-caudal fin base 1.45, origin of anal fin to mid-caudal fin base 1.51, all in standard length; width of head 2.00, snout 3.34, diameter of eye 2.50, interorbital 6.45, postorbital 3.18, length of caudal peduncle 2.17, depth of caudal peduncle 3.84, length of longest dorsal spine 1.38, longest anal fin ray 4.45, longest pectoral ray 2.35, longest ventral ray 1.33, gill opening 6.67, all in length of head (tip of snout to upper angle of gill opening).

Body short, laterally compressed; dorsal profile of head steep, concave, with an angle of  $44^{\circ}$ , ventral profile slightly convex, with an angle of  $29^{\circ}$  (angle formed by slope of head and a straight line drawn through axis of body); body and fins covered with small spines; origin of dorsal fin closer to tip of snout than to base of mid-caudal rays; dorsal spines tapering abruptly to sixth spine, first dorsal spine long and strong, 5.8 times the length of last spine; anal fin short, the origin closer to base of mid-caudal rays than to tip of snout; pelvic spine long and strong, three times the length of the first jointed ray, first ray 1.48 times longer than second, soft rays small and weak; mouth small, teeth in jaws small, conical, slightly curved, largest anteriorly; eye large, diameter greater than length of snout.

*Color* (in alcohol).—Body and fins uniform light brown.

*Remarks*.—Breder (1927, p. 75) mentioned that the second ventral ray had passed unnoticed until L. L. Mowbray mentioned this to him; however, a third small ray has been overlooked.

This rare species has been previously recorded only twice, so far as can be determined: Poey's type, from Cuba, in 1861, and Breder's two from the Caribbean in 1925.

This specimen resembles Breder's figure (1927, p. 75, fig. 33); however, the counts are the same as in Poey's type, except for two small ventral rays in the axil of each large pelvic spine. Upon examination of the type, there were present three rays in the pelvic fin instead of two. The third ray had adhered to the second and therefore had been overlooked. The origin of the dorsal fin in the type is midway between the tip of the snout and the caudal base, while in the present specimen the origin of the dorsal fin is closer to the tip of the snout than to the caudal base. Fraser-Brunner (1941) has examined one of Breder's specimens and states that it is identical with Poey's type.

TABLE 2.—MEASUREMENTS OF NEW SPECIES OF CALLECHELYS, RHEGMA, GILLELLUS, MICRODESMUS, AND ANARCHIAS

	Expressed in thousandths of standard length											
	<i>Callechelys bilinearis</i>		<i>Rhegma bermudensis</i>		<i>Gillellus greyae</i>		<i>Microdesmus woodsi</i>		<i>Anarchias yoshiae</i>			
	Type	Paratype	Type	Paratypes	Type	Paratypes	Type	Paratypes	Type	Paratypes	Type	Paratypes
Standard lengths (mm.)	597	571	34.5	23-38	48	36.5-62.5	145	136	46.5-116			
Depth of body	029	029	290	278-288	167	146-192	052	044	036-043			
Length of head	079	078	406	408-435	229	223-238	069	110	110-129			
Width of head	...	...	159	152-174	167	146-179	076	042	045-048			
Tip of snout to origin of dorsal fin	024	026	406	408-423	177	176-192	111	...	...			
Tip of snout to origin of anal fin	...	...	667	667-695	333	325-370	503	...	...			
Dorsal fin base	...	...	565	544-577	760	759-809	...	...	...			
Anal fin base	...	...	246	252-261	660	608-695	...	...	...			
Tip of snout to vent	558	551	595	609-630	...	...	494	389	405-481			
Vent to caudal base	367	371	...	...	...	...	493	619†	569-594†			
Snout to ventral fin base	...	...	...	...	...	...	076	...	...			
Snout	008	007	073	065-074	037	038-043	012	016	015-019			
Eye	004	004	087	093-100	046	040-049	007	007	008-009			
Interorbital	...	...	029	030-035	015	008-018	007	009	007-008			
Upper jaw	022*	021*	188	185-195	104	088-104	021	039	041-043			
Length of gill opening	012	011	...	...	...	...	015	...	...			
Length of caudal peduncle	...	...	101	104-115	...	...	...	...	...			
Depth of caudal peduncle	...	...	101	104-109	...	...	...	...	...			
Length of caudal fin	...	...	246	250-261	146	120-162	069	007	005-007			
Length of pectoral fin	...	...	345	282-391	...	...	038	...	...			
Postorbital	...	...	232	238-261	...	...	...	...	...			

\* Tip of snout to inner rictus.

† Tip of snout to tip of caudal fin.

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